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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/848,997	05/04/2001	Lup San Leong	1016-013	8978

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EXAMINER

GUERRERO, MARIA F

ART UNIT PAPER NUMBER

2822

DATE MAILED: 07/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/848,997

Applicant(s)

LEONG, LUP SAN

Examiner

Maria Guerrero

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Election filed June 11, 2002.

Claims 1-20 are pending.

Election/Restrictions

2. Applicant's election of Group I claims 1-14 in Paper No. 3 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 15-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 3.

Claim Objections

3. Claim 7 is objected to because of the following informalities: the term "bake" is misspelled in claim 7, line 10. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

4. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Long et al. (U.S. 5,173,766).

Long et al. teaches placing a semiconductor wafer having an interlevel dielectric layer (ILD) on a wafer holder of an oven, applying mechanical pressure to the ILD layer using a mechanical device, and applying heat simultaneously with the mechanical pressure (Fig. 11, col. 14, lines 23-35, col. 32, lines 60-68, col. 33, lines 3-6). Long et al. shows applying the mechanical pressure includes relative motion to assist in planarization (col. 24, lines 7-20).

5. Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Levert et al. (U.S. 6,407,006).

Levert et al. teaches placing a semiconductor wafer having an interlevel dielectric layer (ILD) on a wafer holder of an oven, applying mechanical pressure to the ILD layer

using a mechanical device, applying heat simultaneously with the mechanical pressure (col. 7, lines 60-68, col. 26, lines 24-26). Levert et al. shows applying the mechanical pressure includes relative motion to assist in planarization, providing a non-sticking motion, sensing and controlling the temperature of the mechanical device (Abstract, col. 8, lines 5-15). Levert et al. shows the mechanical device using a roller (col. 7, lines 20-27).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levert et al. (U.S. 6,407,006) in view of Oaks et al. (U.S. 6,083,661).

Levert et al. teaches placing a semiconductor wafer having an interlevel dielectric layer (ILD) on a wafer holder of an oven, applying mechanical pressure to the ILD layer using a mechanical device, applying heat simultaneously with the mechanical pressure (col. 7, lines 60-68, col. 26, lines 24-26). Levert et al. shows applying the mechanical pressure includes relative motion to assist in planarization, providing a non-sticking motion, sensing and controlling the temperature of the mechanical device (Abstract, col. 8, lines 5-15). In addition, Levert et al. teaches spinning a low dielectric constant ILD material and curing the low dielectric constant ILD material (col. 3, lines 10-15, 53-60,

col. 7, lines 45-65, col. 17, lines 17-55). Levert et al. shows the mechanical device using a roller (col. 7, lines 20-27). Furthermore, Levert et al. teaches an annealing process (col. 24, lines 53-60).

Levert et al. does not specifically describe soft baking the low dielectric constant ILD material at a soft bake temperature, holding the low dielectric constant ILD material at a temperature below the hard bake temperature (between 100°C and 400°C).

However, Oaks et al. describes soft baking the low dielectric constant ILD material at a soft bake temperature, holding the low dielectric constant ILD material at a temperature below the hard bake temperature (between 100°C and 400°C), and hard baking the low dielectric constant ILD material (col. 16, lines 60-65, col. 17, lines 10-15, col. 19, lines 65-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Levert et al.'s process by specify the use of a conventional soft bake as taught Oaks et al. in order to remove the solvent not removed during the spin-coating process (Oaks et al., col. 19, lines 65-67).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Robinson (U.S. 6,103,638), Paranjpe (U.S. 5,434,107), Matsuda et al. (U.S. 5,679,610), Doan et al. (U.S. 6,331,488), Potter (U.S. 4,794,021), Blalock (U.S. 5,967,030) teach a planarization process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 703-305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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June 27, 2002



CARL WHITEHEAD, JR.
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